

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

NOV. 8, 1948



Around the world, from the United States to Australia, from The Netherlands to Pakistan, Consolidated Vultee's fast, roomy Convair-Liners are bringing new standards of performance to airline operators. Eight major airlines* have specified Hamilton Standard propellers with hollow steel blades incorporating internal electric de-icing on their economical, 40-passenger airliners.

*Continental, FAMA, KLM, Orient, Pan American World, Sabena, Trans-Canada, TWA

SETTING THE PACE IN JET PROPULSION....

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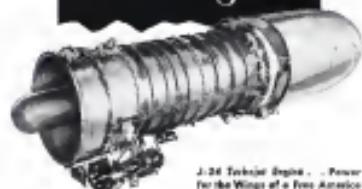
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THE AVIATION WEEK

Battle of the Budget

Although the baltors have barely been counted and the gruel calling the 85th Congress to order will not fall for another two months, the armies and the admirals are maneuvering for another bitter battle over the future of American air power. Even the most sanguine estimates of the 1949 campaign should be a bitter and more decisive encounter than the fay of last spring. Skirmishing is already back in the public notices with a host of newly presented arguments extolling the virtues of the independent Air Force as its first birthday临近 in the fall and an Navy Day but month, 150 admirals solemnly predicting 150 reasons why bigger and better carriers are needed.

The Strategic

But the real blows are not being traded as the speakers platforms however sermonous may grow the debate. It is in the budget hearings of the National Military Estab. Insmnt com in progress that the hand to hand struggle is waged.

It is the emergence of the National Military Estab. Insmnt budget for fiscal 1950 that will show the lines along which the Congressional battle will be fought. Preparation of the budget, normally due in mid-September, has been twice postponed and induction now are that it will be a tight squeeze to get it into the President's January budget message to Congress. The Budget Bureau has already set a \$13,000,000 ceiling on the national defense budget. It is obvious that all three services cannot be satisfied under such a ceiling. Whichever is spared the basket will put up the strongest appeal to Congress.

The Air Force has already laid its opening blast in the Congressional battle with a declaration by Senator H. Styles Bridges (R., N. H.) in the Aircraft Industries Association publication *Phaser* that the 70-Group Air Force bill will get top priority from the new session of Congress. Bridges is a powerful voice on Capitol Hill in chairman of the Appropriations committee and a member of the Armed Services committee.

Navy Need

In the same publication Rep. Chester Morow (R., N. H.), a lesser Congressional luminary, boasts of the

Navy's need for 37,545 new planes in the next six years.

With Democratic control of the Congress, President Truman will probably have more success in enforcing his budget strict than he did during the last session of the 80th Congress. An and on around the White House to Capitol Hill such as was staged by the Air Force last spring will be difficult if not impossible to manage during the 81st Congress.

It now appears that whatever tactics the Navy employs in its fight on Capitol Hill, it will be essentially a man against action. The Air Force was the resulting victory during the last Congress and will still be on the offensive pushing the second step in its five-year 70-Group program with the maximum it gained from almost unanimous support last spring. It will have the added advantage now of having for the first time in history a weapon indubitably capable of wiping the kind of strategic air war that critics have been talking about for 30 years. The proving out of the Convair B-36 has naturally strengthened the Air Force hand at least temporarily. For Air Force generals are now 80% Congress with a straight face that they have the means to deliver atomic bombs anywhere within the significant northern hemisphere without the use of advanced bases on foreign soil.

Can't Match

Crushing all of the possible tactical shortcomings of the B-36 in combat, the Navy has nothing that can match the weapon at the present time. The supercarrier is at least five years away. It does not yet have a plane properly equipped to carry the atomic bombs and no practical carrier based atomic bomber that could yet fit within the Navy's theories on air-based strategic air power.

Perhaps the best case the Navy can muster for its immediate role in strategic air war is the proposal by Capt. Schleicher reported elsewhere in this magazine for a combination of submarine and long-haul bombers launching a Navy type bomber as in long haul to and from a potential long target. The current carrier-based aviation of the Navy could be used only in support of amphibious operations and in sweeping the seas of enemy warships and submarines. At the moment that need seems less urgent to legislators and public alike than the requirement for the means of delivering atomic bombs swiftly and surely deep into the heart of a potential foe. Perhaps this will be the issue on which the coming battle of the budget will be fought.



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AVIATION WEEK, November 8, 1968

TOUGH, DEPENDABLE,
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NEWS DIGEST

DOMESTIC

Flight Safety Foundation transferred an aircraft accident investigation center (Aviation Week, Nov 1), opening today, from Woods Hole, Mass., to Madrid, 1st Air Base, Madrid, Spain. Art Linn, Director of the center, and Marvin C. Meier, president. He has been a dispatcher for United Airlines and Western Airlines. He succeeds George E. Domagalski, deceased.

Prison aircraft segments for September reported to Aircraft and Aviation Assn. No. 3 to 375 Aviat 680 to August. Value totaled \$2,460,000, up 32.75% from August. Shipments included 591 free-place, 216 two-place.

Aerospace Airlines' newest department workers at Langley Field, members of Local 311 of Transport Workers Union, voted a two-day strike which began when management members postponed use of other members in taking inventory. About 140 employees were involved. AA's operations were unaffected.

FINANCIAL

Douglas Aircraft Co. reported net income after taxes of \$1,850,735 for nine months ended Aug. 31, or sales of \$88,251,121. For the same months ended Aug. 31, 1967, company had net loss of \$3,176,017. Aug. 31, 1968, backlog was \$202,381,000, 93 percent of which was military. Backlog data not include about \$70 million in military contracts not yet signed.

McDonnell Aircraft Corp. reported net income after taxes of \$5,675,628 for nine months, Jan. 30 on sales of \$22,158,936. For previous year, net was \$940,870. June 30 backlog totaled \$90,573,671, 95 percent in Navy production contracts, 2 percent Navy experimental and 3 percent USAF experimental work. Backlog is highest in company history.

Republic Aviation Corp. reported net income after taxes of \$12,374,539 for nine months ended Sept. 30 on sales of \$59,171,579. Earnings include nine hundred dollar income by credit of \$779,000. Backlog is about \$73 million, Aug. 31. F-104 Thunderbolt sales.

Canadair Ltd. Co. delivered a record of 35 aircraft during the 700,000 hours of manufacturing since, saysable Dec. 8. In fiscal year ended Sept. 30, company's sales increased about 40 percent to approximately \$14,250,000.

Koren Co. announced dividend of 50 cents a share payable Jan. 2, 1969 to holders of record Dec. 15, 1968. In fiscal year ended Sept. 30, company's sales increased about 40 percent to approximately \$14,250,000.

AVIATION WEEK, November 8, 1968

INDUSTRY OBSERVER

► Fairchild Engine and Airplane Co. has completed first two prototypes of the C-119, an improved version of the Pegasus with a detachable fuselage. Production line is being set up to begin the initial 30 production models of the C-119 while new parts are being fabricated for the C-123 prototype.

► Prototype of the Australian-built de Havilland Dove has completed its company trials and is now with the Royal Australian Air Force for acceptance trials. Second experimental model of this medium transport will add seven seats to eleven seats at the only major change over the first model.

► A pusher type Gooseneck motor is being designed by Monico Defense. The motor will be built in Texas. Defense claims the design will get 200 mph out of the 85 hp Continental engine expected for the motor. The Gooseneck is 17 ft. 5 inches long with a wingspan of 16 ft. 4 inches.

► Second Martin XB-45, an improved jet bomber has been flown to Naval Air Test Station at Patuxent, Md. for preliminary flight test before delivery to Wright-Patterson Air Force Base. First XB-45 which made its first flight more than a year ago is still undergoing flight tests at Wright-Patterson.

► Boeing Airplane Co. will expand its activities at its existing government-owned Renton, Wash. plant. Boeing is using about one-third of the Renton plant for storage but will eventually produce experimental models of the XB-52 and XB-53, giant turboprop bombers there. Production of the XB-52, an improved version of the B-50 powered by Pratt & Whitney YBV engines is also scheduled for Renton.

► Certification of the Convairline for a new gross takeoff weight of 395,000 lb., riding nearly 3000 lb. to service load, will be sought by Lockheed in flight tests due to start immediately. Moderate strengthening of several structural parts will be required for the new load condition, but will increase empty weight by not more than 301 lb. Lockheed plans to make modification kits available to new-type Convairline owners for modification of their equipment to new weight allowances after certification is granted.

► Ryan Aeronautical Co. is now at work on a \$1,525,000 subcontract from Boeing for the construction of Stratocruiser fuselage sections. The 14 ft. 6 in. sections comprise the rear fuselage of both the commercial Stratocruiser and the Air Force C-95A cargo center.

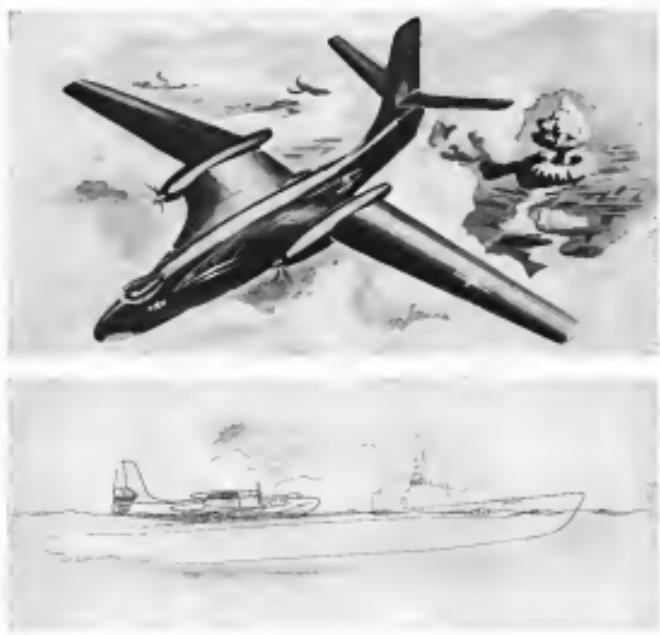
► Industry observers wonder how long Air Force and Navy experimental test planes are going to have to sit their crash test beds out of their own production because Wright Field and BuAer procurement officials refuse to classify them with the new types of production hardware used by most aircraft company test pilots.

► Trans-Canada Air Lines is switching from four to three-bladed propellers on its North Star (DC-8/4-31) transport in an effort to alleviate passenger complaints of excessive noise. Embraer officials who are being redesigning to classify their noise away from the cabin.

► The Indian four-engine transport, Breda Zeppelin 305, has completed its initial test flight at Milan. This transport is powered by British Bristol Centaurus engines and is now under for British Airlines and the Argentine Air Force.

► Avro's Skystreak bomber is nearing completion and is expected to fly early next year. The long range reconnaissance bomber, originally designed for Coastal Command, is larger than the Lancastrian and is powered by four Rolls-Royce Griffon reciprocating engines.

HEADLINE NEWS



Plane-Sub Team Devised for Navy

By Robert Hine

A new type of Naval strategy was proposed last week for the long range delivery of atomic bombs on enemy targets. It would link the new type flying boats now under development by

the Navy with submarines in a tactic that could, according to its proponents, deliver atomic bombs economically and effectively.

The operation is predicated on two developments already well advanced: first, the development of a fast long

range flying boat with performance equal to that of the best land-based bombers now in production; and second, the provision of submarines equipped to function as flying boat tenders capable of refueling and serving these planes at sea.

► **Use U. S. Base**—Utilizing this equipment a flying boat could take off from any port in the United States, refuel from one or more submarines based at sea and take aboard an atomic bomb from the submarine tender, make an attack on targets as far away as Japan, return to the flying boat's base, land on water, and begin a 2000-mile return flight to its base, refueling, possibly, en route to another submarine, for refueling on the way home. Advocates of this tactic point out that it allows the twin advantages of surprise and economy.

Cost of a speedy flying boat and its submarine tenders would be only a fraction of the price of a super carrier and its train or a land-based very heavy bomber group and its accompanying and defense weapons. By using atomic, dispensing submarine bases has the potentialities of surprise for this type of attack, say advocates.

► **Imp Use Model**—During the last war the Japanese used this type of tactic in their Hawaii campaign, after their initial attack on Pearl Harbor. This little-published attack was made by two Japanese B5N-type flying boats based on Wake Island. On the night of March 4, 1942, they were refueled by French Frigate *Surcouf*, went to Hawaii, by this specially equipped tender, refueled from the Japanese fleet. They flew to Hawaii where they dropped bombs near a high school in Honolulu. The afterword of before it reached Oahu did not know. Neither Navy nor Air Force planes were able to make an interception.

The Navy has already announced it has recovered one of its survivors to an American team. Submarines capable of harboring and repairing flying craft were developed before the last war by the French and Japanese. Construction of a modern submarine in a flying boat tender would be relatively simple according to Naval experts.

► **Schliephake In Proposes**—The use of flying boats and submarines for long range, surprise atomic bomb attacks was proposed by Capt. C. H. (Duke) Schliephake, USNR (ret.), a pioneer in the development of long range flying boats.

It has been discussed unofficially with a number of high ranking Naval and civilian officials, who have advised new government funds to encourage its execution. Navy officials have, for any official comment on the proposal. It is believed that official Navy endorsement of the project might be confirmed as a spinoff of the Stewart arrangement in which the Joint Chiefs of Staff gave the Air Force primary responsibility for strategic bombing.

► **Flying Boat Pioneer**—Schliephake has been a Naval aviator since 1933. He was a first pilot at the Naval Aircraft Factory where he was associated with the testing of the Glenn L. Martin Ci

Latest Orders Announced by AF

U. S. Air Force last week confirmed American Wright's exclusive story on Sept. 27 that it had received an order for 100 F-104 Starfighters for 1969. The 100 aircraft will be delivered in three batches: 30 aircraft in 1969, 30 aircraft in 1970, and 40 aircraft in 1971. American Wright also confirmed American Wright's exclusive story on October 4 that California had won the Air Force twin-engine transport competition with a modified version of its conventional transport Convair Liner.

Latest orders for fiscal 1969 as announced by the Air Force:

► **Boeing Airplane Co**—30 F-4C jet bombers.

► **Northrop Aircraft Inc**—30 Reader (C-123) transport transports.

► **Convair**—37 F-105 twin-engine fighters.

► **Cessna Aircraft Co**—12 Model 195 four-place executive transports.

► **Sikorsky Division of U.S. Helic**—180 four-place executive helicopters.

► **Kirfert Type**—Orland—An order for 30 Kirfert XH-10 sea-plane transport helicopters will also be placed by USAF but not yet determined who will produce the Kirfert-developed model.

USAF will buy \$46,200,000 of its fiscal 1969 procurement funds to spend

approximately \$16,800,000 in unexpended for guided missiles and other ordnance, \$10,000,000 for refueling aircraft, \$10,000,000 for F-104 Starfighters after modification of 30 F-104s.

► **Type Changes**—Changes in plane types ordered since the original procurement schedule was planned has cut the total number to be bought from 1727 to 2159. Shifts from low cost piston planes and helicopters to expensive jet bombers and transports caused the reduction of 188 planes from the original procurement program approved by the Joint Session of the 88th Congress. Purchase of 10 Boeing B-57 jet bombers at approximately \$4,000,000 apiece and 100 Convair Liners to be used as pilot trainers in an advanced helicopter version suitable for bombardier and navigator training were the major changes in the final procurement allocations responsible for the 188 plane reduction.

Meanwhile the Navy put a request to spend an additional \$16,968,000 for new aircraft plant facilities and model airplane. Of this fund \$67,360,000 will go for new planes.

have been proved feasible by research of the National Advisory Committee for Aeronautics and many of them are already incorporated in experimental aircraft being built or being completed.

► **Tender Requirements**—The submarine tender would take the flying boat aboard its own submarine deck (bottom deck) and lift the plane into position for refueling and taking aboard atomic bombs by means of its own hoist (lift) tools and bringing the plane to the surface.

Schliephake pointed out that certain rough water handling characteristics would not be required for these flying boat tenders since the refueling operations could be conducted in relatively sheltered waters, the use of hoists at other port facilities would be required.

► **Dodge Proposes**—The flying boat configuration and requirements for carrying boat at the deck top (top deck stow) featuring the high length boats will, ideally, stand on the Convair XP5Y-1 tankless carrier for carrying and transport plane for maximum speed in the target area; a gall wing to keep propeller clear of the water, and a tricycle wing float. This flying boat would gross about 140,000 lb., have a range of 4000 miles at 4000 miles and be capable of 450 mph at 35,000 ft.

All of the design features required

for a flying boat with that performance



F-80 Flies on Ramjet Power Alone

As part of engine development program, more than 100 flights made with units mounted at wing tips.

A piloted aircraft has been flown solely on ramjet power. The first was accomplished for the first time Nov. 21, 1947 by Tom Lovell, Lockheed chief engineering test pilot, in a Lockheed F-80 jet fighter with ramjet units mounted at the wingtips.

Subsequent ramjet flights have been made by Capt. R. T. "Tom" Schaefer, Lockheed test pilot, and R. L. Smith, flight test engineer, as observer. The flight hour mark made from Lockheed's flight test base at Van Nuys, Calif., set a new Major Air Force Base, Calif.

Marquardt Engines—The ramjet engines were designed and built by Marquardt Aircraft Co., Venice, Calif., under an Air Force developmental contract. Two sets have been used, one 30 in. diameter and 7 ft. long and one other 10 in. diameter and 10 ft. long.

Since the ramjet engines used silicon as an insulating coating, the 7 ft. 0 in. engine had to be coated with a 0.05 in. film of silicon. An Allison J-31 ramjet engine has flown to a speed of about 600 mph and an altitude of 20,000 ft. before the ramjets are ignited. After the ramjet engines commence, force to the jet engine is transferred and the plane flies on ramjet power alone.

Research Project—The ramjet project which has been under way for more than a year at Lockheed, in a research program on the development of the new jet engines and is not designed to test the performance of this F-80 which is used merely as a high speed test vehicle. More than 100 flights have been made during the program.

The F-80 is instrumental to account for a total drag and fuel consumption of the ramjet engines. Research is being made by means of a census measured before s

special instrument panel, providing a continuous photographic record of airspeed, altitude, fuel consumption, air temperature, fuel temperature and altitude data.

Plane Test—Initial firing of the ramjet produces a flame tail 30-40 ft. long from the aft end of the nose. The flame tail is extinguished when the engine power is reduced to 15,000 ft. As the engine is run, the upper relationship between airspeed and fuel speed is attained, the flame tail disappears. The ramjets are extremely noisy, however, and the airplane may be heard far easier than is one of the technical objectives in their use.

Major advantage of the ramjet engine is its ability in producing increasing power as increasing airspeed and it has been found that the total power of the high altitude ramjet is about 100 times that of the low altitude ramjet. Ramjet thrust extended across the day for as much as 100 miles behind the booster.

Test Caps—The first two crew consisted of Air Force Capt. Jay Wadsworth and Capt. Fred Bretholz, Northrop test pilot; Capt. Orval El Douglas and Capt. W. H. Mathews, Northrop. Eight engineers and two mechanics were invited to the controls during the flight.

At the time of the first powered flight the first F-80 Fitter was brought to the fact that the TB-40 took off at a gross weight considerably less than its maximum 21,500 lb. Although about 13,000 lb of jet fuel had been carried, this capacity can be increased to as much as 15,000 lb. In the use of both jet fuel cells, permitting the craft to stay aloft more than 13 hr and cover well over 4000 miles.

Production Model—Although the production YB-35 Flying Wing version is claimed to have heavier because of its 10,000 lb. to 10,000 lb. air re-inforcement, the shorter wings of the TB-40 result in an better aircraft with a heavier brother in the Air Force. Air Force has ordered 100 B-36s (Whirlwind) and 84 B-47s (Boeing). The B-47s have designated a "whole" communication version carrying a lower weight of mission equipment.

PRODUCTION

AMC Pilot Plant

Michigan factory would be proving ground for high volume techniques.

AMM Muroc Complex of the U.S. Air Force plants lead Air Force contractors in the lead toward new high volume production techniques for aircraft fabrication.

The Air Force call for AMC to operate a plant at Willow Run, Mich., where the largest aircraft production capacity in the world would be installed. They are later to receive with mixed industry representation and transportation, an Airframe Work Survey disclosed last week.

Major Gen. K. B. Walker, AMC's director of procurement and industrial planning, was principal backer of the project, sees the Adams plant as a proving ground for new manufacturing methods which might yield greatly in volume of aircraft production in war emergency, and yet which an individual avionics builder might not wish to undertake because of initial costs.

Opposed—Opposed—Skeptic. Indians, too, are apprehensive of the expansion in the capacity as a result of a resolution passed by the Board of governors last spring. Opposition stand was again indicated at a Defense conference called at Wright Field to discuss the project further.

If the plan is carried through as proposed, a large new extension goes to gather with supplementary purchasing power and facilities will be installed at Adams for Air Force operations on industry projects. It is understood that procurement of the big new program will be handled by the Defense Department, which will be asked to make the funding contribution to finance them.

► **Canada Fittery**—Following the installation of the big new press, the projected manufacture at Adams of two other large rotating vertical press of 15,000 tons and 7000 tons, which are being shipped from Canadian plants in the Americas come in Germany.

Ability of the big press to form large components of aircraft structure which require relatively low finishing operations is expected by AMC to reduce greatly part losses in some places of aircraft manufacture. Smaller press are now made by reliable little smaller components, or by expensive machine tools.

► **Long Engages**—Supplementary problems in the use of the big press is the supplying of larger weights for working larger single parts.

Designation of Richard F. Trimble,

chief of AMC's industrial planning division, as plant one at Wright Field's top flight aircraft contractor, to monitor the project, indicates its high priority at AMC.

► **Desaults Cited**—These objections to the proposed operation cited by industry representatives to AVAFAIR were:

• Government operation of the Adams plant might be considered an early step in a trend toward nationalization of the aircraft industry.

• Advantages of the method to be used at Adams over existing methods of production for some parts are offset in large measure by the complications of establishing manufacture of major components in one plant, with existing tooling, part possibilities.

• Operation of smaller equipment by private industry should be more fully explored before the government establishes its own operation.

The Adams plant is a Defense Plants Corporation division, operated in World War II by Rohr Aircraft Co. in an aluminum aircraft plant. It has 780,000 sq ft of floor space. Part of the plant is now being leased by Kaman Trans. Sales Co. from WAA for warehouse purposes, but Kaman President has agreed to return space as it is needed for the plant project. It is understood that utilization of the big new proposed press will be limited to the Defense Department, which will be asked to make the funding contribution to finance them.

► **GFE Question**—If AMC operation of the plant is carried through it presents another possibility in the extension of government furnished equipment (GFE) in the future, to include school components of the aircraft structure. Considerable, this could even involve original specifications requiring that a certain aircraft be designed to include a specific model designer or manufacturer. While the present effect of the trend of specification on the aircraft designer would considerably complicate advantages of such a system is an other phase of the old design vs. production dilemma which may eventually have to be resolved.

SEC Reports Increase In Aircraft Sales

Second-quarter sales of leading aircraft manufacturers were up \$44,000,000—\$21,000,000 in aircraft and \$23,000,000 in the Securities and Insurance divisions. Nonstock firms had a sales volume of \$263,385,000, compared with \$217,165,000 for the second quarter, 1947.

Second-quarter volume was up \$15,212,895—17 percent—from first-quarter sales of \$221,515,800.

► **Four Leaders**—Four firms showing the sharpest sales increases for the second quarter (with second quarter, 1947, sales in parentheses) were North American Aviation, Inc., \$20,073,000 (\$3,565,000); Boeing Airplane Co., \$17,560,000 (\$8,174,000); Chase L. Martin, \$13,711,000 (\$4,532,000); Republic Aviation Corp., \$12,761,000 (\$6,821,000).

Manufacturers with the largest sales volume for the second quarter were: United Aircraft Corp., \$19,997,000. Sales were down from \$18,810,000 for the second quarter, 1947.

► **Lockheed Aircraft Corp.** Sales of \$13,461,000 were up from \$29,949,000 for the second quarter, 1947.

► **Douglas Aircraft Co., Inc.** \$12,611,000. Sales were down sharply from \$16,851,000 for the second quarter, 1947.

► **Carrier-Wright Corp.** \$13,602,800. Sales were up from \$10,916,000 for the second quarter, 1947.

In addition to Douglas and Chase, others showing sales declines for the second quarter were: Convair, \$11,300,000. They were (with second quarter, 1947, sales in parentheses) as follows: Northrop, \$6,924,000 (\$3,363,800); Beech, \$5,473,000 (\$7,399,800); Ryan, \$1,744,000 (\$2,551,600); Ryan, \$2,854,000 (\$3,677,000); and Bellanca, \$711,000 (\$510,000).

SEC reported as follows on sales in excess of other firms (with second quarter, 1947, sales in parentheses): Bell, \$6,866,000 (\$4,236,000); Convair, \$4,713,000 (\$2,615,000); Consolidated Vultee, \$1,400,000 (\$1,576,000); Pima, \$6,460,000 (\$4,941,000); Grumman, \$6,581,000 (\$4,150,000); and Wien, \$511,000 (\$21,000).

PRODUCTION BRIEFING

► **Chinese Vought Aircraft** division of United Aircraft Corp. expects to have FEU-1 Navy jet fighters rolling off the production line of its new Dallas factory by February. FEU-5 piston engine fighters will begin coming off the line in April. Present employment at Dallas is about 1400.

► **Tenn Engineering & Mfg. Co., Dallas**, has agreed to wage increases of 30 cents an hour for about 2300 hours a week. GM rates ranged from 90 cents to \$1.00. In addition, an automatic pay increase of 10 cents an hour.

► **Cook-Tec Chemical Co.** is arranging for the construction of an electron compound plant in St. Louis, as well as the Los Angeles home plant.

THE SUPERMARINE 'ATTACKER'

Outstanding British Fighter

Recent performances of the Vickers-Supermarine "Attacker" have confirmed it to be the world's most outstanding jet fighter. The speed and general maneuverability of the "Attacker" were simply demonstrated on February 27th of this year when, on its first full military deployment, it covered the International 100 Kil. Closed Circuit at an average speed of 361.8 m.p.h. Previously, the "Attacker" had carried out a series of successful deck landing trials on the Aircraft Carrier H.M.S. "Aldwych". These trials confirmed its unique control characteristics under the low speed conditions necessary for deck approach. A feature of particular interest to Pilots called upon to undertake deck flights is speed at the smallest visibility from the cockpit.

IN THE AIR

Speed, maneuverability and control of the "Attacker" are the result of the unique design of the aircraft. Vickers-Supermarine "Attacker" has a maximum speed of 361.8 m.p.h. at 10,000 ft. Maximum range is 300 miles at maximum speed. The "Attacker" goes up in 10 sec.

50-82



VICKERS-ARMSTRONGS LTD. - VICKERS HOUSE - BROADWAY - LONDON - ENGLAND

AVIATION WEEK, November 8, 1948



LANDING 'UP'

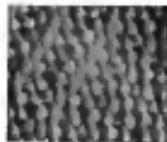
The "Attacker" has demonstrated the ability to land "up" on a fighter scale. The "Attacker" has been shown to land on a carrier and carrier deck. The "Attacker" has also demonstrated a rapid take-off ability and has landed on a carrier deck. The "Attacker" has demonstrated its ability to land on a carrier deck.

RECORD-BREAKERS

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NEW LOOK
in operator's
costumes

Throughout work areas where New Departure micro-instrument ball bearings are produced, you'll see operators dressed in smooth, specially selected fabrics. This is probably good. It is important however to give greater consideration to the possibility of dust or other particles getting into and in any way affecting the functioning of these precise, highly sensitive instrument bearings. Such attention is due to the characteristics of the bearing. See details at New Departure.



Specially selected synthetic fabrics are used in the manufacture of these smooth, ribbed, knapping fabrics of the material and selection of heat or insulating fibers.



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MICRO-INSTRUMENT BALL BEARINGS

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AVIATION WEEK, November 8, 1948

ENGINEERING



Design Analysis

Northrop C-125 Based on Pioneer

In contrast to usual practice, this multi-purpose military transport originally was conceived to meet commercial cargo plane needs.

By Robert McLaren

The Pioneer transport has been thoroughly evaluated by Northrop Aircraft Inc., Hawthorne, Calif., in the evaluation of its Radar military version.

Larger, heavier, and with greatly improved performance, the new transport version features special facilities for the loading of many types of military loads from a variety of loading surfaces.

The Radar will be virtually a new airplane and promises only the simplicity and economy of its prototype together with its outstanding take-off and landing characteristics.

► **Commercial Background**—Northrop began design studies of a piston-engine aircraft during the closing days of World War II when no defense manufacturer had the time with any degree of certainty. Without exception, all of the major military aircraft producers of World War II at their postwar sights on commercial aircraft design thought the first design era had ended and even more severe reduction in the Spring of 1945.

Despite Northrop's switch to a commercial aircraft as a postwar project, the

existing design had wound up as a military plane.

The original Pioneer was laid down as a "bush freighter" with specifications selected on the basis of requirements for operations from small, rugged areas in Central and South America.

From the start, short take-off and landing characteristics were desired and Northrop segments out with the plan of achieving take-off and landing characteristics.

► **Design Considerations**—Radar at these rigorous design specifications was not a novelty and not one with exceptional flight performance, but it did possess the unique feature, mentioned previously, of an admissible design. But from the start the Pioneer project met with wholly unpredictable difficulties that presented even a substantial complication of the craft's design.

The Wright R-1800 engine specified

for the plane was not available at the time of its completion in Fall, 1946.

This engine had originally been de-

veloped prior to the war but further work was dropped in the face of demands for the R-2800 and R-3350 power plants.

The R-1800 was again made an active Wright project in 1945 to meet the demands for the Lockheed, Boeing and Northrop "Tulsa" class aircraft then in design.

Initially, Northrop was forced to install than Pratt & Whitney R-1800 831H engine with a takeoff power of 600 hp and a rated power of 530 hp. This 25 percent reduction in design power available forced the use of the performance of the Pioneer from the start but it was decided to go ahead with the flight test program as the intent of spending up the project as much as possible.

► **Test Programs**—First flight test was made from Northrop Field in December, 1946, with Max Stanley at the controls. The craft was whence in 1000 ft., although neither full takeoff power nor full collection was used. The test program got under way immediately and continued throughout 1947.

During the fall of that year the new Wright engine became available and installed. The additional power, how-

EVERYTHING IN AVIATION WEEK

AVIATION WEEK, November 8, 1948

1570 units for emergency takeoff from confined areas with heavy load.

An unusual feature is the provision for attachment of a turbine to a fitting mounted in the fuselage, which permits the use of both outboard engines to assist the two plane during takeoff and climb. This owing provision permits greatly prolonged operation for the Racer.

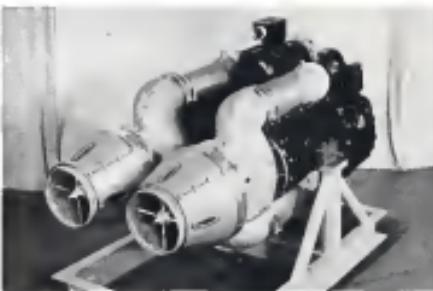
► **Science Fiction**—Throughout the redesign of the Racer, the capability of the prototype Power has been preserved.

Availability for maintenance has been stressed throughout the design with doors and panels provided adjacent to installations requiring service or inspection.

Safety has been stressed through over-temperature protection either through a door in the flight deck door or through a panel beside each seat. And a large escape door is provided in the rear cockpit. All doors are interchangeable in design.

Systems have been improved by the addition of cockpit windows below the main windows, which permit vision almost vertically downward.

Throughout the structural design of the airplane, subassemblies have been made self-contained units with simple attachments, similar to possible, to facilitate field replacement.



Auxiliary-Power Turbine Readied

Solar Aircraft Co., San Diego, has produced a development model of a small, low-power gas turbine to provide auxiliary electric power at high altitudes.

Overall weight of the power plant, complete with generating equipment, burner and accessories, is approximately 790 lb. Overall length is 52 in.

It incorporates several unique features, including an original reverse flow method of air handling.

The engine has been developed primarily to supply 900 c.c. of 135/2000 rpm electrical power at high altitudes.

Overall weight of the power plant, complete with generating equipment, burner and accessories, is approximately 790 lb. Overall length is 52 in.

It incorporates several unique features, including an original reverse flow method of air handling.

Air is taken ahead through a propeller air intake between compressor and burner, and moves forward through the total flow, multistage compressor to a centrifugal impeller which drives at 1000 rpm two cylindrical combustion chambers in ends of the dual cans.

After passing through the combustion chambers, where fuel and heat are added, the hot gas moves through the turbine and is exhausted through conventional exhaust annulus, while it may be used for augmentation if desired.

The dual cans are mounted in a single assembly with each can shaft geared to drive the generator.

The high electrical loads specified for modern jet craft, plus the necessity for keeping power extracted from the main turbines to a minimum, is making auxiliary power increasingly important.

By utilizing a gas turbine-powered generator for this purpose, conventional jet fuel may be saved and substantial amounts of thrust for the aircraft provided.

The Model 50 will not be ready for commercial availability until early next year. Solar has driven on its extreme background as a producer of high-altitude jet engine engines and test-resistant aircraft manifolds in the design and fabrication of this new auxiliary power plant.

Spring Transducer Wide Application

Many important applications in the field of servomechanisms and other mechanical actuators are based on highly sensitive electro-mechanical transducers developed at the National Bureau of Standards by W. A. Wildhack and associated personnel.

The device transduces slight displacement into large changes in resistance, current or voltage. Active element is a helical or coiled spring so wound that axial tension varies slightly along its length. Thus, when the spring ends are pulled apart, the transducer can be used over a wide range of displacements.

► **Resistor**—When the spring is entirely closed, it has an electrical resistance approximately that of a cylindrical tube. When compressed, electrical resistance is increased to the total length of the coiled wire. Accordingly, resistance can be varied over a wide range by stretching the spring.

Since percentage change in resistance may be hundreds of times greater than percentage change in length, displacement as small as 1/100,000 in can be measured easily without electrical amplifying equipment. The spring transducer that provides a sensitive means for conversion of any mechanical displacement to a change in an electrical quantity that can be precisely determined.

► **Resistor**

When the spring is entirely closed, it has an electrical resistance approximately that of a cylindrical tube. When compressed, electrical resistance is increased to the total length of the coiled wire. Accordingly, resistance can be varied over a wide range by stretching the spring.

For conversion of any mechanical displacement to a change in an electrical quantity that can be precisely determined.

► **Wide Application**—When connected to another transducer which gives a mea-



Experimental model of new transducer. Weight pushes longitudinal displacement of rod, elongating one pair of springs and shortening other pair as Wheatstone bridge. The resultant resistance of bridge gives measure of displacement.

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observed displacement output (for example, a bimetallic strip expanding on temperature changes), the differences give a readily measurable electrical output.

The type of use suggests numerous applications—strain gages, pressure transients, accelerometers, electrical weighing devices, automatic temperature controls, d.c.-a.c. converters, and voltage regulators.

►How It's Made—Preferable construction for the transducer is a four-terminal bridge, with each arm a variable-tension spring. Because an applied tension changes one pair of springs and leaves the other pair alone, relative displacement of the bridge, as indicated by a galvanometer, gives a measure of the displacement. With this arrangement, since the voltage can be nearly constant through the bridge, output voltage will be approximately twice the value of the input voltage.

Variation of orbital tension of the spring along its length may be by conical winding, varying the angle of feed and the wire on a uniform spooland, or by varying its tension as it is wound. For greater sensitivity, variation in orbital tension is made quite small.

To decrease contact resistance between successive forms of the closed coil, a high melting metal lacquer is built onto the spring, and the forms are coated with 600-m gold. Generally, nickel-alloy wire was not used because of its high resistivity and small change of mechanical properties with temperature.

The new transducer is undergoing further development at the Bureau as part of a project on bone instrumentation for scientific research by the Office of Naval Research.

Roughness Comparator

To enable engineers and draftsmen to visualize, select, and specify machine characteristics for production work, and machine operations and sequences to determine by sight and feel whether machines from most designated manufacturers, packed-up complete with enclosed fixtures is announced by Special Products Division, General Electric Company, Schenectady 5, New York.

Two rods, 6 in. long and 1/8 wide, illustrate degrees of roughness ranging from smoothness of bearing surface to roughness of flame cut. One side of each rod is divided into 12 parts, totaling 24 different positions corresponding to 16 degrees of roughness. Every degree is identified by a number which designates the measured roughness of microscratches (average).

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American's Convairs were put through the most intensive testing—under actual operational conditions—ever given a plane by an airline. Carrying cargo and mail, Convairs were flown over 100,000 miles on regular, coast-to-coast schedules. In tests and in scheduled service,

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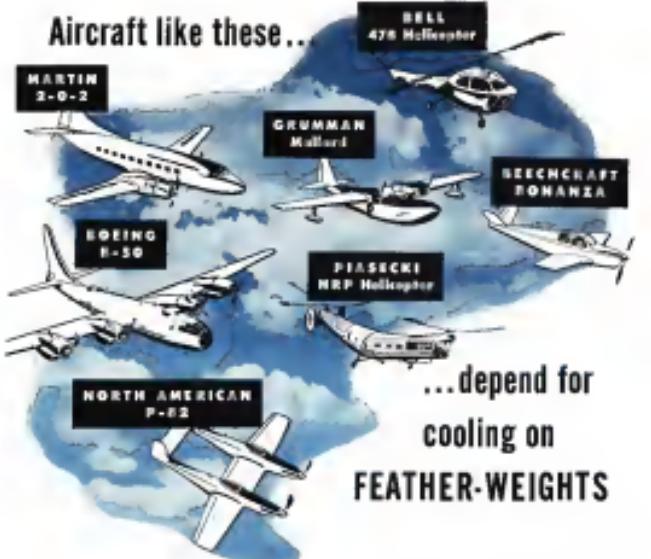
For 14 years, without interruption, Sinclair has aided American Airlines in maintaining constant schedules, rigid operational standards, and dependable service. American, in that time, has flown more than 350 million miles with no other engine lubricant than former Sinclair aircraft oil.

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Aircraft like these...



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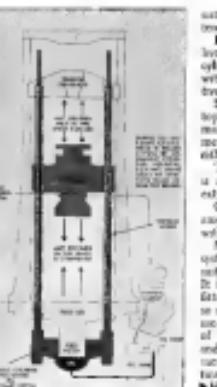
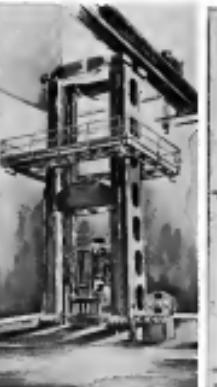
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CLIFFORD



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HYDRAULICALLY-FORMED BELLows



Navy Using Largest Test Machine

New 5 million-lb-capacity proving device made available to industry. Huge structures to be accommodated.

Navy has announced that the world's largest testing machine, the new 5,000-ton-capacity hydraulic test stand at Philadelphia Navy Yard, will be made available to aircraft manufacturers for accelerated tests regarding their transmission load. Most powerful such machine ever built, the site will also be used for tests on aircraft, ship and car assemblies.

The huge device costs \$140,000 and is housed in a 100x100-ft. steel structure and concrete foundation, including the concrete foundation and an elevator to permit access to all surfaces. It took two years to build at the Baldwin Locomotive Works.

The 5,000,000-lb. maximum capacity of the machine, greater by 1,400,000 lb than any previous test stand, will provide the aircraft industry with loads needed maximum applied load.

The machine can exert tension, compression or bending loads in regard to increments as low as 4 lb.

Navy has already had a testing program to include 77-88,000 psi 787 aluminum alloy extrusions, sandwich structures, complete wing panels, aero-scope bridge segments, etc.

► **Machinist's Facilities.** The installation stands 47 ft. above the floor floor and extends 36 ft. below.

► **How It Operates.** The machine can

act, automatically, of three distinct operations, for loading, weighing, control.

In the loading system, the pump delivers pressure to the hydraulic cylinder, which is forced down, pulling with it the large piston and the movable crosshead.

Since the piston encloses the top and the bed (at the bottom) remains stationary, the downward movement of the piston crosshead applies either a load on a specimen or a tension load. The weighing system, also hydraulic, is supplemented by an air system for extra sensitivity.

Control system includes both mechanical and electrical units connected with the loading and weighing systems.

Most important unit of the weighing system is the rotary cell, which measures load pressure to the indicator. It is a piston cylinder having a loose fitting piston and a metal diaphragm so arranged that the load on the specimen produces change in the film of liquid trapped between the piston and the cylinder bottom. Relative movement of piston and cylinder is practically negligible.

► **How It's Replicated.** Controls are all housed in a single cabinet. There are hand-wheel knobs for application of the hydraulic load at any level speed between 0 and 5 in. per min., for retrieving our release of the load on a specimen, and raising and lowering the loading head (for positioning purposes) prior to testing. Speeds are 0 to 20 in./min. speeds.

Starter buttons above the hand wheels control the power for the various electric motors which raise or lower the elevator, around the hydraulic pump, and turn the screw for positive stops of the loading head.

Several knobs on the upper part of the cabinet permit control of loading rate, reference monitoring of top predetermined constant load, and selection of any one of the six load ranges.

Large dials on the cabinet indicate the load control on a specimen. Smaller dials allow readouts of air pressure in the line to the servo-valve motor which is part of the weighing system, air pressure for the load control system, air pressure in the back-lash elevators on the large screw, and position of the loading head to 16 in. stroke.

In addition to air pressure test feature, the machine will give results on full size structures for correlation with tensile test on scale models.

The will make modeling a more accurate basis for design. Proportionate changes in size of structures usually do not produce proportionate changes in strength properties. But what the ratio happens are will be determined by comparison of test results and computer runs.

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Flow control valve, suitable for fuel, hydraulic fluid and lubricating oil. Also for high flows of low pressure air, steam, compressed air, oxygen, propane, natural and volatile gases.

Two-way, Electro-magnetic valve for distribution of fuel, air or "heat" to and "returning" fuel from a cylinder system to tank.

Two-way AV-13 valve for automatic control of various fluids, air, water, gasoline, oil, etc.



Two-way valve, type can, bidirectional pressure or to 5000 psi, for control of fluid pressure operated cylinders.

Two-way magnetic valve for medium and high pressure applications. Controls fully automatic pressure of air, oil, water, etc. 20 psi to 2000 psi. 2400 psi operating pressure.

Temperature controlling control-operating valve for aircraft engines. Operates the carburetor fuel and heating coil.



Two-way direct type valve. Electro-magnetic valve for control of all types of fluid pressure air, water, hydraulic oil, steam or oil, operating cylinders, etc.

Two-way magnetic, double-acting, two-way selector-type valve for control of fluid pressure operated cylinders.

Electromagnetic type valve with solenoid, magnetic valve, two-way, double-acting, for all types of fluid, gasoline, air, water, oil, etc.

For complete specifications and engineering data, request new Catalog.

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**New Anti-G Coverall
 Gives More Protection**

An improved anti-G suit, which answers many of the shortcomings of the current coverall type, has been developed by Air Materiel Command.

The new coverall, Model G-1A, standardized for standardization throughout the Air Force, is patterned after the service's modern flying suit.

► **Sliding Details:** Abdominal and leg sections consist of single-ply, vinyl-coated Nylon cloth bonded to cotton with a vinyl-coated cotton fabric.

Side fasteners are used to open the suit, one not extending down the inside of each leg and another inserted diagonally from a point just above the right hip to the center of the garment at the neck. Fasteners are arranged to prevent interference with the bladder details.

► **Premature Adjustment:** Instead of each leg is covered to prevent snagging or being adjusted. The cover hangs loosely to prevent the appearance of an ordinary flying suit. The blouse is of the same type and material, the garment not being strained and reduced without further adjustment.

Bladder, forming a single interconnected system extending along the abdomen, thighs and legs, are larger than in the currently-used Model G-1A suit.

► **Materials:** The garment is fabricated from two sections instead of the all Nylon suit previously used. Because of the stability of Nylon to absorb perspiration, the upper section has been made of absorbent Woddy cloth. Lower section is made of Nylon because of the greater stretch it would give.

► **Adjustable Fasteners:** To improve the efficiency of the G-1A with the G-1A suit in reducing or preventing the complaints involving skin expansion to radial armament, 11 subjects were exposed to heat in the "Russia air lab" at Wright Field, first with no salt, then with the garments. Use of average protection afforded by the G-1A suit is followed (as published) by first the G-3A, Clear suit (14G (79G), dust visor, 14D (90G), prophylactic lights 14G (81G), and black out 2 SG (74G).

► **Anti-G Protection:** To compare the efficiency of the G-1A with the

G-1A suit in reducing or preventing the complaints involving skin expansion to radial armament, 11 subjects were exposed to heat in the "Russia air lab" at Wright Field, first with no salt, then with the garments. Use of average protection afforded by the G-1A suit is followed (as published) by first the G-3A, Clear suit (14G (79G), dust visor, 14D (90G), prophylactic lights 14G (81G), and black out 2 SG (74G).

Special-Metal Piston Ring

A new step compression ring for gas or Diesel engines, made from a special metal, K-100, has been developed by Bausch & Lomb, Inc., optical products division, Rochester, N.Y.

Used in combination with rings, the metal is stated to increase 50 percent more spring quality and four times the resistance to combustion shell. It is reported that it won't break during installation or in service.

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Only Walter Snow Fighters, with the superior traction of the Four Point Positive Drive, can provide the great pushing power and speed to effectively use these high capacity plows, as well as the Walter pressure center scraper blades.

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Cowling former specifically designed to meet demands of high speed service is marketed by Dom Fassone Co., Inc., Babylon, N.Y. Designated "Super max," and consists of fully enclosed spring steel cowlings engaged by snap-on bodying and quick release principle so that opening or closing is obtained by rotating the snap. Device is available in all standard sizes and measurements of lengths specified in Specification ASN Z-56, and maintains a wide built-in flanging and stayaway form.



Tests Pressurized Cabins

Developed by Goss Hydraulics, Inc., Brooklyn, N.Y., Model CLP-1 pressure and cabin test pressure is designed for checking on high altitude aircraft such as Boeing Stratocruiser, Douglas DC-6 and Lockheed Constellation. Compact device is mounted on rubberized wheel for portability with use of car or hand truck. Unit is powered by electric motor and incorporates an air canister pressure capable of delivering up to 400 cubic feet of air at 10 psi to the cabin. Hose lines and couplings are provided. Pressure and temperature of air to place are accurately controlled by relief valves. Fluctuation and pressure and temperature of air canister are used to indicate exact cabin condition. Average type of pressure gauge meter and manometer manometers are used to indicate rate of cabin pressurization.



For Control Engineers

Precision electronic manometer, Semicircle, developed by Service Corp., 2030 Jersome, Tarrytown, N.Y., Hyde Park, N.Y., is designed to furnish between performance data about manometer or pressure control and may be used to check complete servo loops or components, such as valves, on



Emergency Light

Portable, emergency aircraft light offered by U.S. Ligh. Mfg. Co., 1530 N. Hickory St., Chicago 22, Ill., has anodized, locked control steel container for two standard dry-cell lantern batteries and connections. Double-flame, single-pole switch gives instant selection of either steady beam or flash with 100-112 flashes per sec., and light is visible to 412 degrees for over 600 ft. Ordinary burning life of batteries is said to give continuous lighting for 18 hr. or steady light for 38 hr. Two radio-controlled buttons are used, to turn on and off the light and to operate three bells in doorway select stems as given. Lens of molded plastic directs light in horizontal beam.



Precision Shear

For rapidly shearing wide variety of materials to extremely close tolerances, O'Neil-Dunn, Mfg. Co., Lake City, Minnesota, offers tool with cutting range extending from light platinum, fiber, wax, leather and rubber to heavy gauges of aluminum and steel. Shear is adaptable to model, research and experimental work and achieves power and fast speed results of a great variety of small sections work. Maximum shearing width is 24 in.; maximum material capacity is 16 gauge sheet steel (162).

CHECK THESE NAVION FEATURES



1 SELECTIVE THROTTLE-CONTROL gives maximum maneuverability. Positive, smooth, instant and positive control power starting with wheel alone. But you have choice while you want it. Roll-over-resistant wing gives full aileron control for maximum safety in slow flight and landings.



2 HIGH-LIFT WINGS. Large, slotted, full-dihedral wings give the Navion distinct, sharp edges of high lift when rising. Weigh only 125 lbs. Roll-over-resistant wing gives full aileron control for maximum safety in slow flight and landings.



3 FOLD-UPON-CRASH. Handily-hinged for easier traffic. Room large, clear, spacious for you or an emergency passenger. No roll-over possible by design. You can even use it as a view mirror . . . rise 12° above the Navion seat.



4 INCREASED DURABILITY. The Navion takes heavy duty components in its basic structure. All major parts are designed for heavy use and long life. Heavy-duty landing and roll-over resistance and low maintenance cost. For permanent beauty, durable natural finishes now standard . . . choice of 4 striking colors.



5 LARGE, USEABLE CABIN. Enclosed ground handling under all conditions. Navion's spacious cabin accommodates four passengers with wheel chair and high speed ground clearance gives rough field and cross-wind landings. A much faster power-operated hydraulic brakes.



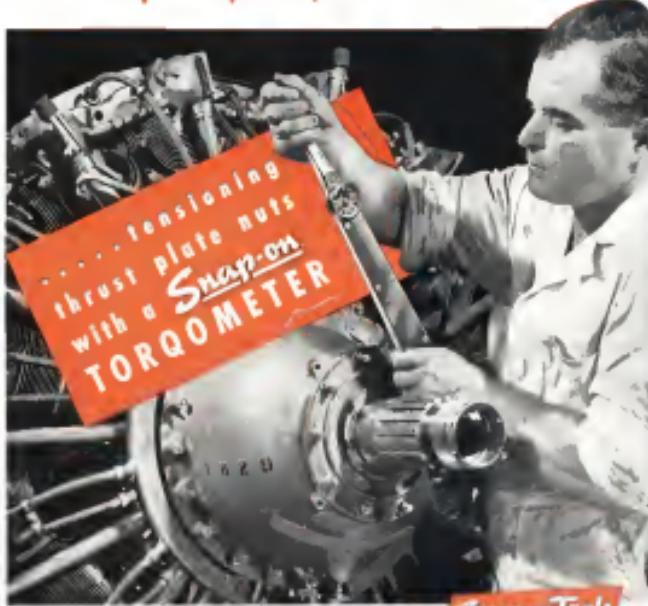
6 ECONOMY CRUISE. Quiet, well-insulated . . . amply styled interior and room to spare . . . room for passengers. Average Navion costs \$17,500. 42" wide, 40" long, 32" high. Capacity with open 710 ft. for miles between intermediate and end. Baggage容积 up to 160 pounds.

7 EXCELLENCE OF PERFORMANCE. 150 mph. cruising speed. 750 mile range with optional reserve tank. Engine air ride. No roll warning, even in rough air. No other plane offers such intelligently chosen and well engineered combination of features. For illustrated booklet, demonstration or free business trip, write us today, on your business letterhead.



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Rely on Ryan RYAN AERONAUTICAL COMPANY, 411 UNDERRISH FIELD, SAN DIEGO 12, CALIF.

When you're glad you have a **Snap-on**



Veteran aviation mechanics agree that the one best way to correctly tension a stud or bolt is to an engineer's specifications is to use a Snap-on Torqueometer. And the veterans also agree that with a Snap-on Torqueometer, you can get the specified pressure every time . . . right to the correct inch per foot pound. There is no guesswork . . . you can see the applied torque as the bolt is tightened.

Torquemeter user range from zero to 30 in.-lb., up to 2,000 ft-lb. capacity. Available through a nationwide, direct-to-user tool service. Write for the new complete catalog of 4,000 Snap-on tools.

SNAP-ON TOOLS CORPORATION
6032 K. 24th AVENUE, KENOSHA, WISCONSIN



The Northwest Airlines logo is a circular emblem. It features the word "NORTHWEST" in a bold, sans-serif font, with "AIRLINES" in a slightly smaller font at the bottom. A stylized, thin-lined graphic of a wing or propeller is positioned in the center, with the letters "NWA" integrated into the design.

Illustrated above is one of Northwest Airlines' skilled mechanics accurately repositioning these plane wings with a Snap-on Torquemeter No. TQ-1100.

AVIATION SALES & SERVICE



Top personnel strength engineers and technical experts attended the recent discussions of space requirements for personnel planes held under leadership of Paul Fred E. Wink, director of Texas A & M College's Personnel Aircraft Research Center, at the center. Left in right photo, seated, H. A.

ers, Ryan Associates Co.; J. M. Chmelar, assistant CAD safety liaison director; Mrs. E. B. Harwood, secretary; Prof. J. E. Fendell, CAA; M. J. Goss, Beach Amoco Corp.; D. C. McGay, Project Engineering & Manufacturing Co.; Mr. H. G. Edelstein, Executive Sec-

plane Corps; I. H. Gorrie, Cessna Aircraft Co.; E. E. Bush, Texas A & M agricultural engineering department; H. F. Klock, Arizona Aircraft Corp.; C. W. Von Rosenberg, CAA; Robert Sinden, Southern Airlines (Pittsburgh); and A. E. Nilssen, NCACA.

Spin Tests May Be on Way Out

CAB and CAA expected to act soon to eliminate long delayed requirement from Civil Air Regulations.

Proposal to eliminate open tasks from Civil Air Regulation certification or guarantees for private pilots has been gathering momentum in industry and government quarters for the past several months and is likely to be approved by CAB and CMA in the near future.

John M. Chantelau, CAB safety regulation director, last month began circulation of a draft of a proposed regulation eliminating the type requirements. The draft was finalized last week at Indianapolis at a meeting of the Non-scheduled Flying Advisory Committee of the CAB.

Specifically the proposed would eliminate subsection 203(6)(A). "A two-ton span is each dimension starting the recovery with an error of not more than plus or minus 10 degrees" and would amend sub-section (4)(i) to include "(C) be have been given instructions in recovery from powerless and powerless shall extend from straight flight and turns."

growing feeling among people in all groups that the spin interviews conducted are not much use to make sure the results are accurate. People don't like to see their names in the news.

responsible for maintaining high test scores for personal account.

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Other in the leadership group of the stage, at the Beach Center & M Col-
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► Others—Others attending the meet-
ing included M. J. Conlin, Birch, J. H.
Cotes, Cessna, H. A. Sotion, Zenith,
H. G. Erdman, Luscombe, D. C. Mc-
Gary, TEMCO, H. F. Kord, Aeropac
Bob Sorenson, Southern Aviation (Eu-
coupé), J. E. Bowden and C. W. Van

most recent place
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of the former
slaves, their wives
and the peasant
class who they served
poorly to
the soil
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they did.

ally mean more competition in the open field, eventually to the single engine plane new in production. The *Prop* If would probably develop an arrangement in each chapter from the League to the Natives which Ryan has been interested in for some time.

► **Opposition** — Much opposition is showing the open experiment appears to be principally at a group of CAA air-leads who oppose change clause and are using state attorney offices at least one state attorney, Director, Director of South Carolina, has said he may invoke state regulations prohibiting the open experiment if federal agrarian land the requirement out.

A publication by CAA's resident safety division, released last month, considers open aviation and points out that practically all of the fatal open accidents we in open which began at an altitude too low to affect country conditions and had to be stopped. The analysis reviewing figures for 1951, the highest year to date, the private flying has ever had, showed a total of 513 fatal open accidents. It called for re-examination as design, rather than the project which the Work organization is undertaking in Texas, in order to change the airplane so that a pilot can "make a landing without getting into serious difficulties."

The summary showed that there were only three open accidents in the entire 515 which were 4500 ft. or more in altitude, aircraft, and that obviously none of the open accidents was found in approach.

Opposition that we not proceed as open experiment could have their still potential interest by use of a member of staff working drivers now being considered, thus eliminating the angle of the open CAB analysis results.

Werner Purchases Interest

Capt. J. V. H. Werner, (Ret'd) president of Werner Systems of Navigation, Avionics, Inc., has purchased a controlling interest in Aeromaritime Systems, Inc., 3115 Irving St. NW, Washington, and will continue to operate the new company in conjunction with his older firm, Thielers C. Lyon, author of *Practical Air Navigation* (CAR No. 24) and of the new revised commercial edition of the same book, it is associated with Capt. Werner as the new firm. Aeromaritime Systems handles charts and navigation equipment, and publishes pilot route manuals for the U. S. and foreign airways, also conducts class and individual instruction in air navigation and handles technical avionics equipment. Lyon is formerly chief cartographer, aeronautical chart hands, U. S. Coast and Geodetic Survey.

BRIEFING FOR DEALERS & DISTRIBUTORS

PRICE TREND CONTINUED—Continued and Louisville last week mounted price increases on their basic engines. Cessna liked the price of its big 185 Firethunder with 300 hp Jacobs engine, up to over \$16,000 in a new price of \$14,550 while the 190 hp 185 with 240 hp engine now sells for \$13,250. Increases are effective as of Dec. 1, firm sales records being held that time will be delivered at present prices.

Louisville has increased the price of the low-wing aircraft Series Series 5475 from \$6995 to \$7475. This price increase, effective Nov. 15, includes addition of auxiliary alternator as standard equipment on the engine. Large Cessna price increase on the Jetrino-powered 195 presumably reflects an engine price jump. The 190 and 195 are virtually identical except for engine.

STATE CHECKDOWN IN OKLAHOMA—Allen Street, Oklahoma insurance director, has written a letter to each county attorney in the state, asking cooperation in preventing any accident claim in the state which involves a perjury against them.

Street has also obtained word from the state highway patrol that the state department's present will be on the lookout for false pilots and other aviation flying. The Oklahoma insurance director said 75 percent of all fatal aviation accidents in the state are caused by coaches, mechanics and drivers flying.

KEESE AND KLOZT HEAD PAC—Election of C. J. (Jack) Keese, president of Continental Motors, as chairman of Personnel Action Council, and Leopold H. P. Kloz, president of Louisville Aviation Corp., as vice chairman, was announced following the recent meeting of the local plane manufacturers in Detroit. Eddie succeeds Duane Walker, president of Cessna, and Kloz succeeds William Klozak, Jr., Shaxon also assumed.

President of the company which makes approximately 90 percent of the engines used in civil aircraft, including training planes, Street has a big stake in the future of personnel aircraft. The PAC, also several other aviation organizations, made its last visit to a conference with CAA administrators Del Reischel, and made plans for further liaison with the administration here in Washington soon.

Private is the committee raising regulations and development problems with hope of getting a more sensible regulatory approach to navigation in its present status. So far, Reischel has passed his first round of industry meetings with a good record.

ATLANTIC AVIATION TRANSFER—Sales and service operations of Atlantic Aviation Services have been transferred from Dupont Airport, Wilmington, Del., to New Castle (Del.) County Airport, Stewart Avenue, Orange, by announcement. Transfer followed completion of a new hangar and hangar bay at the former ATE base, south of Wilmington. The move was planned as a consolidation of Atlantic's maintenance operation and to facilitate service in customers in the Wilmington area.

Atlantic Aviation Service will continue to keep Dupont Airport in operation, with hangars used for storage and with shop service, parts and assistance to transients. The house is closed, however, and all training operations are being transferred to the New Castle base.

TAYLORRAFT MOVE—Expanded service and supply facilities for the 16,000 Taylorraft airplane flying, as well as additional production facilities for new engines, are to be provided in the new facility of Taylorraft Inc., at Conshy-Pittsburgh Airport, Conshy, Pa., according to C. G. Taylor, president.

The move takes Taylorraft back to near its original home. President Taylor says that conception of the then 1449 Taylorraft two-seater has been good enough to require revised production schedules, and that plans are under development for a four-place Taylorraft. Company is also seeking contracts for military aviation components and equipment.

Bob J. Moore, chairman of Taylorraft's board of directors, is operator of the Conshy Airport where the new plant for Taylorraft is now under construction. Plant will be long one story straightline, mostly structure with two bays outside, and designed for additional expansion as needed.

—ALEXANDER MCGURK



The Birdmen's Perch

by Major Al Williams, AUAS, "FATIGUED WING TIPS," Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.



and supported by the students at the Marion County Public School System, we hereby designate it such schools Beachhead's Perch!

Be sure it's a super rugged structure with cutouts on the corners, etc.

And when you send it down to Delta, Florida, remember that the Perch will be proud to read a certificate each year to the manufacturing aviation students as furnished by the school board. Ask me to let you know.

HERE IT IS!

Close your eyes and imagine driving the family buggy into your Goodwillerton



Osceola, Florida, is one of the most positive communities in the country, that's what!

Down there the Marion County Public School System gives regular graduations credit to high school students for volunteer academic and flight courses. The CAA approved mechanics school gives three credits a year to students. The flight school gives one credit to solo students, two to students who will then receive commercial certificate before graduation.

And this, too, isn't buyers. The students get their time for two J-3's and a PT-19 for \$2.50 an hour!

We're mighty pleased to hear that the gang over Gulf Aviation Products evidently will be mighty pleased soon if they didn't, because this is one of the soundest, mostest forms of erosion education that we've ever heard of!

Henry Miller has a great composite model for hanging up in a school. Say on it that because of the splendid program of amateur education undertaken

Think all the time that transits which cost and clutter your workshop... check your time... go checking over your car for loose hardware.

Okay, so now we're going to give you this same service on your present plane!

We're working on a super service for the private pilot at the Allegheny County Municipal Airport, and Pittsburgh. We'll have buildings with a pilot's lounge, a dinner room with plenty of table and chairs, and telephones.

From a separate lounge for the girls.

On Saturday, we'll have a motorized, self-service type gas pump and my \$1.00 and 50 cent Gulf Aviation Gasoline. And the Gulf Service Center won't be in the middle of a fog overhead when you want them, either. That's my motto!

Well be to back after your winter needs. See you in spring!

We'll keep you posted on the work progress.

LITTLE KNOWN FACTS DEPT.

Cancer hobbies... gardening!



We haven't gotten enough Farm family to make in our top 10 list, but we're getting it. We can't print it, but we can't wait to read our readers' families, double Congratulations on Fresh Prince (between me and me).

Thank goodness for people like F. E. Tammey, a TWA Captain in Washington, D. C., who proves our

The top of the discounted catalog is the top 500 flying hours... a 100% greater than the one of a DC-3 trip!

Send him a Communion, Please!

Then go on and look in the classified and see if anyone she has met in some hot Little Known Facts On Well Known Places.

Even on post cards!

Gulf Oil Corporation and Gulf Refining Company...makers of



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Cut Costs
with DANLY
KWIK-KLAMPS

PROFITABLE USES

- Holding work during assembly.
- Applying pressure on plastic parts.
- Holding parts for light machining.
- Positioning work for inspection and testing operations.

TIME ON PRODUCTION WORK

Progressive manufacturers are cutting production time and costs by using Danly Kwik-Klamps. These unique, adjustable clamps are the most reliable parts found in the displacement work shop. They are used in assembly, disassembly, and holding operations in assembly work for processing. Kwik-Klamps are manufactured to very exacting standards. They are available in sizes from 1/2" to 10" and assembly tables to clamp and hold work.

SHRK POSITION CLAMPING ACTION

Shrk's unique and unique design is made possible by the use of a unique "shock absorber" that holds a clamp in position. This unique design is unique in different sizes and provides a wide range of applications. A wide range of the handle is available to meet the needs of the user by applying holding pressure on the clamp line.

COMMITTEE CUTTING AND HOLD DOWN

FREE—Information on Danly Kwik-Klamps, Tongue Chucks and assembly tables. Danly Kwik-Klamps hold work in place during assembly, disassembly and holding operations. Write Danly Kwik-Klamps.

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SHORTLINES

American Overseas—Late last month started the third anniversary of the first scheduled commercial transpacific service to Europe. During the past three years ADA has carried 17,000 passengers, 7,252,493 lb of freight and 2,490,600 lb of mail. Canada is currently operating 15 roundtrips weekly between the U.S. and Europe using Constellations and DC-4s.

Alaska—Has petitioned the U.S. Court of Appeals for the District of Columbia to review CAL's Middle Alaskan air service decision of last February which denied the company's application for a contract to operate second class mail service between Washington, Newark, Pittsburgh and other points.

EDAC—Recently flew over 9000 lb of food from Montreal to Gander enroute to relieve a shortage caused by a Newfoundland oilfield strike.

Colonial—Last week planned to cut by 20 percent production as roundtrips totals between U.S. and Canadian points. The 30-day extension limit will be available to passengers who can arrange departure for Tuesday or Wednesday with return on any day except Friday or Saturday.

Eastern—Forecasts for the first nine months of 1948 were well ahead of the same period last year, and long-distance profits are anticipated. Company says it has not had unfavorable public reaction to the continued premium fare on its Goodfellowes despite the elimination of extra charges on DC-3s by other carriers. Agreements are being signed with international forwarding houses and travel agents whereby the present commissions will be paid for handling shipments which originate over the company's system and use domestic flat cargo cars. Freight rates in San Juan, Puerto Rico, have been cut around 30 percent.

Interstate—Walter F. Johnston has become assistant treasurer.

Pan American—Passenger and cargo volume to Alaska for new all-time peaks during September. Company flew 318 passengers and 10,000 lb of freight during the 30-day period ending in 42 tons in September, 1947. About 15 percent of the business was shipped to the West Coast marine ports.

Scandinavian Air Lines—Has appointed the Biltz Co. exclusive sales agent to dispose of its surplus DC-3s and C-45s. The American planes are being replaced with Scandinavian aircraft.

PLUMBERING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS



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→ **FACILITIES**
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AIRCRAFT PRECISION PARTS

Two of your most important requirements—for first quality and prompt deliveries—are consistently met by Kohler. Kohler quality is a 75 year-old tradition. Prompt deliveries are made possible by the fact that Kohler maintains full facilities for casting brass and aluminum; forging, machining, plating; and anodizing. All Kohler aircraft valves and fittings are made under the "approved" rating of the Army Air Forces.

Kohler precision parts are currently being used by the Nation's foremost aircraft manufacturers, including all leading manufacturers of jet engines. The Kohler line includes a wide variety of types and sizes—and Kohler engineers will cooperate with you in developing whatever valves and fittings you may need to meet special requirements. Write for our illustrated Catalog T.

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AVIATION WEEK, November 8, 1948

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meet every Operational Need

THE A.R.C. TYPE 11A

Micro base needs by providing for VHF Transmission, LF Range Reception and Rotatable Loop Navigation.



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Combines the advantages of the Type 11A and the Type 21, offering 2-way VHF, together with LF Range Reception and Rotatable Loop Navigation.

All units of these systems have been Type-Certified by the CAA. For the highest standards of design and manufacture and the finest in radio equipment, specify A.R.C.

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• **Scandinavian Airlines System**—introduced DC-3s on its South Atlantic run to Buenos Aires recently.

• **Transamerica**—is launching a \$40,000,000 sound program and plans to 1960 expand its regional and other operations, adding contracts and assistance. A year ago TAL had around 600 employees. Otto M. Nelson, president, says 300 employees are at Oakland, Calif., for Pacific division flight operations, 700 at Oakland for operations of the sub-sidiary Aircraft Engineering and Maintenance Co., 100 at Atlanta, Ga., with the London Anti-Submarine Station, 170 at the Atlantic-European division base at Hatfield, Canada, and 150 are now at the San Francisco base of the Atlantic and Pacific divisions. Company has decided not to affiliate with the independent San Cesar Aviation because TAL operations are primarily international.

• **TWA**—Passenger loads originating overseas hit all time high in September. Company officials say the rate increase for trans-Atlantic air travel will be longer than that in 1947.

• **United**—Has authorized payment of the regular quarterly dividend of \$1.25 a share on the company's 4 percent cumulative preferred stock. Dividend will be paid from capital surplus.

• **Western**—Freight handled on the first nine months of 1948 was 48 percent above the same period last year.

• **West Coast**—Carried 33,581 passengers on the first nine months of 1948—14,093 more than in all of 1947. By year end, passenger traffic is expected to be 75 percent above 1947.

CAB SCHEDULE

For non-Scheduled air freight traffic in continental cities. (Delays 100 to 110.)

For 1—Starting on Pan American Airways' Northeast Clipper American 8480 route, October 1, 1948, 10:00 a.m.

For 2—Starting on TWA's trans-conti-

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EDITORIAL



They Stand in Line for Train to Tomorrow



Mid-Tropics Line Hid Indian Village



Flight Drew 1,167,867 Passengers



Eastern Roads' Exhibit Drew Thousands

Railroads Sell the Public

THIS will be open the Railroad Fair next June in Chicago, "bigger and better than ever." This year it drew 2,500,000 persons in 76 days. The "Wheels of Progress" alone attracted 1,167,867 paid passengers.

It was a brilliant public relations achievement, and the most spectacular public exposition any transportation industry ever presented.

Actually, because our railroads already carry more domestic passengers than any other transport means, they had fewer new customers to win over than other transportation. But they are investing in the future.

We are not advocating that the hard-pressed air transport industry should match the \$12 million Railroad

Fair, which is heated to obtain an only one of America's population centers.

But we are convinced that next spring or summer a modest but nationally planned, cooperative airline program to let Mr. Average Citizen look over and fly both to our great highways, now in home towns, would pay rich dividends.

Millions more would fly if they were offered a free cleanup tour, to build confidence. Seats of aviation present nowa days are sold already. If one street keeps them sold, the future is in the first ride of tomorrow.

ROBERT H. WOOD



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"Lucite" is used for antennae, turrets, nose blisters, canopies, wind-

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Skyhook

These two General Electric technicians are preparing the "Skyhook" for a whirl. The Skyhook is a jet-propelled helicopter blade—a project for the U.S. Air Force that has been underway for more than a year at the G-E Flight Test Center in Schenectady, in co-operation with our Aircraft Gas Turbine Divisions in Lynn, Mass. The all-steel blade is located, for testing purposes, in the center of a bowl-pit, 150 feet in diameter and 13 feet deep.

This jet-helicopter development is one of the first of its kind, and unique in size and design . . . another "first" for General Electric.

We invite you to take advantage of our background and experience. Let our design and production engineers help you with your aircraft equipment problems. In research, development and production of components for aircraft, G.E. leads the way. For more information on General Electric products and their applications, call our nearest sales office, or write *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*



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